ABSTRACT OF THE DISCLOSURE

This invention is a process for producing diisobutylene from isobutylene. The process comprises first oligomerizing isobutylene to diisobutylene using a sulfonic acid-type ion exchange resin. The oligomerization step is followed by contacting the diisobutylene product with an adsorbent to remove sulfur impurities produced during the oligomerization step. The adsorbent is a large pore zeolite such as zeolite X and zeolite Y. Optionally, the purified diisobutylene may be hydrogenated to isooctane using a hydrogenation catalyst.